SPACE FOR ROUGH WORK / रफ कार्य के लिए जगह

10

Optional Paper

Computer Science

Paper – I

3 Hours Maximum Marks : 200

IMPORTANT NOTES / महत्वपूर्ण निर्देश

Please fill up the OMR Sheet of this Question Answer Booklet properly before answering. Please also see the directions printed on the obverse before filling it.
प्रश्नोत्तर पुस्तिका में प्रश्न हल करने से पूर्व उसके संलग्न ओ.एम.आर. पत्रक को भली प्रकार भर लें । उसे भरने हेतु उसके पृष्ठ भाग पर मुद्रित निर्देशों का अध्ययन कर लें ।

The question paper has been divided into three Parts - A, B and C. The number of questions to be attempted and their marks are indicated in each part.
प्रश्न-पत्र अ, ब और स तीन भागों में विभाजित है । प्रत्येक भाग में से किये जाने वाले प्रश्नों की संख्या और उनके अंक उस भाग में अंकित किये गये हैं ।

Attempt answers in English.
उत्तर अंग्रेजी भाषा में से दीजिये ।

Answers to all the questions of each part should be written continuously in the script and should not be mixed with those of other parts. In the event of candidate writing answers to a question in a part different to the one to which the question belongs, the question will not be assessed by the examiner.
उत्तर पुस्तिका में प्रत्येक भाग के समस्त प्रश्नों के उत्तर क्रमवार देने चाहिये तथा एक भाग में दूसरे भाग के उत्तर नहीं मिलाने चाहिये । एक भाग में दूसरे भाग के प्रश्न के उत्तर लिखे जाने पर ऐसे प्रश्न को जाँचा नहीं जा सकता है ।

The candidates should not write the answers beyond the limit of words prescribed in parts A, B and C failing this the marks can be deducted.
अभ्यर्थियों को भाग अ, ब और स में अपने उत्तर निर्धारित शब्दों की सीमा से अधिक नहीं लिखने चाहिये। इसका उल्लंघन करने पर अंक काटे जा सकते हैं ।

In case the candidate makes any identification mark i.e. Roll No./Name/Telephone No./Mobile No. or any other marking either outside or inside the answer book, it would be treated as resorting to using unfair means. In such a case his candidature shall be rejected for the entire examination by the Commission.
अभ्यर्थी द्वारा उत्तर पुस्तिका के अंदर अथवा बाहर पहचान चिन्ह यथा – रोल नम्बर / नाम / मोबाईल नम्बर / टेलीफोन नम्बर लिखे जाने या अन्य कोई निशान इत्यादि अंकित किये जाने को अनुचित साधन माना जावेगा। अभियोग सत्य ऐसा पाये जाने पर अभ्यर्थी की सम्पूर्ण परीक्षा में अभ्यर्थिता रद्द कर दी जावेगी ।

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PART – A

Marks : 40

Note : Attempt all the **twenty** questions. Each question carries **2** marks. Answer should not exceed **15** words.

1 What are the searching algorithms of data structure? Give their complexity.

2 What is complete binary tree? Give equation to calculate its depth.

3 What is DEQUE?

[Contd...

4 Let P and q denote positive integers. Suppose a function F is defined recurssively as follows.

$$F(P,q)=\begin{cases} 0 & if \quad P<q \\ F(p-q,q)+1 & if \quad q \le P \end{cases}$$

then find F(11,3)?

5 What is the concept of devide and conquer algorithm?

6 What are structured analysis tools?

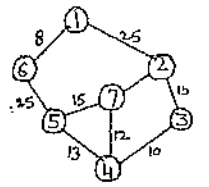
7 Let a complete undirected graph G have n vertices. Find the number of edges in a vertex complete graph?

8 Suppose a weighted graph G is maintained in memory by a node array DATA and a weighted matrix W as follows :

DATA=X,Y,S,T

$W=\begin{pmatrix} 0 & 0 & 3 & 0 \\ 5 & 0 & 1 & 7 \\ 2 & 0 & 0 & 4 \\ 0 & 6 & 8 & 0 \end{pmatrix}$. Draw a picture of G.

9 Draw minimum cost spanning tree for the above graph.



10 What is meant by cohesion and coupling?

11 What is vector generation? what are its algorithms?

12 Describe the use of halftoning?

13 What is the output of following

```
main( )
{
    unsigned int y=12;
        int x=-2;
    if (x>y)
        printf("x is greater");
        else
        printf("y is greater");
    return0;
}
```

14 Give diagram for different states of a process in a multiprogramming environment?

15 Give the concept of thread?

16 What is the fullform of DDR SDRAM?

17 Explain ternary operator with example?

18 Write down the interpretation for following machine instruction.
A 1,901(2,14)

19 What is lexical analysis?

20 Describe the use of gets() function in C?

PART – B

Marks : 60

Note : Attempt all the **twelve** questions. Each question carries 5 marks. Answer should not exceed 50 words.

21 Translate following infix expression into its equivalent postfix expression.

A / (B * D) /E-F * (G + H / K)

22 Write algorithm of traversing a linear array?

23 What are the objectives of software testing?

24 Give data flow diagram symbols ? Explain briefly with example.

25 What is homogeneous coordinate system? Give homogeneous co-ordinates matrix for following.

(i) Translation (ii) Scaling

(iii) Rotation (iv) Shearing in x-y direction

26 Explain flat panel display. What are its types? Explain briefly.

27 What is deadlock? What are its necessary conditions?

28 Using Number system convert following ?

(i) $(110101.101)_2=(?)_{10}$ (ii) $(237.04)_8=(?)_{10}$

(iii) $(10.111)_2=(?)_8$ (iv) $(54E)_{16}=(?)_2$

29 Consider the following snapshot of a system.

Process	Allocation			Max			Avail		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

(i) What will be the content of NEED matrix ?

(ii) For any one process (P_0,P_1,P_2,P_3 or P_4) write down the steps for checking safe state status?

30 What is loader? What are its functions? Give names of various loaders.

31 What is meant by exception handling? What are the basics of exception handling?

32 Consider the following segment table :

Segment	*Base*	*Length*
0	200	410
1	85	15
2	126	100
3	1300	05
4	2525	150

What are the psysical addresses of following ?

(i) 0120 (ii) 106 (iii) 290 (iv) 310 (v) 4120

PART – C

Marks : 100

Note : Attempt any 5 questions. Each question carries 20 marks. Answer should not exceed 200 words.

33 (i) Write down an algorithm for binary search.

(ii) Write a program in C language for binary search.

34 (i) Consider the line from (1,1) to (5,6) use DDA algorithm to rasterize this line.

(ii) Explain depth buffer method.

35 What is macro? What are the basic task a macro instruction processor must perform? Draw simple one pass macroprocessor flowchart.

36 (i) Suppose the moving head disk with 200 tracks is currently serving a request for track 75. If the queue of requests is kept in FIFO order : 83,17,123,91,55,146; What is the total head movement for the following Disk scheduling schemes:

(a) FCFS (b) SSTF (c) C-SCAN

(ii) Consider the following snapshot of processes. Make Gantt chart and compute average turn around time and waiting time of processes for FCFS, SJF and SRTN algorithms.

Process	Arrival time(ms)	Next Burst time(ms)
P_1	0.0	6
P_2	0.5	4
P_3	1.0	2

37 Explain spiral model of software engineering with diagram?

38 Write a program to find the product of two materices using operator(*) overloading inC++.

39 (i) Explain the concept of call by value and call by reference.

(ii) What is recursion? write a program in C to find the factorial of a Number using recursion.

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